

MACH WEIGHTED AREA RULING FOR SUPERSONIC VEHICLES

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ABSTRACT

A method and design system for a low drag vehicle includes determining a plurality of configurations for at least two different Mach numbers that minimize the rate of change of cross-sectional area of the vehicle in accordance with the Sears-Haack minimum drag body. A user can specify design objectives and constraints to meet in determining optimum configurations for the vehicle, and the configurations are averaged to determine a final configuration. The at least two configurations can be weighted to emphasize optimum performance at particular operating conditions before averaging the configurations. The second order derivative of cross-sectional area for the final configuration can be smoothed, and then integrated twice to determine the cross-sectional area.